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Date: September 18, 2012

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From: Tarek Ladaa, Shaw

Subject: Former George AFB - October 2012 Basewide Groundwater Sampling Event

The Fall 2012 groundwater monitoring event is scheduled for October 2012 and will include gauging the depth-to-water for all groundwater monitoring and extraction wells and analyzing groundwater samples from select wells for volatile organic compounds (VOCs), compound specific isotope analysis (CSIA), dieldrin, and/or geochemical parameters. The methods and analytical suites for groundwater sampling are provided in the Draft UFP QAPP (Shaw, 2012a). The list of monitoring wells to be sampled is provided as Table 1.

The overall objectives of this groundwater monitoring event are to:

- Verify compliance with the ROD (OU1 and OU3)
- Monitor seasonal variation in groundwater elevation and flow patterns
- Monitor concentrations and areal extent of contaminants of concern (COCs), and
- Monitor post-closure performance of remedial actions implemented at landfill sites.

There are six sites associated with the basewide groundwater monitoring event: CG070, LF012, OT069, SS030, OT071, and ST067b. Some of the monitoring wells are used to monitor multiple plumes and the data collected will be used for reporting on more than one site. The list of monitoring wells to be sampled was determined based on the rationale provided in the Groundwater Monitoring Decision Tree (Figure 2-1; MWH, 2012), the Tech Memo for CSIA (Shaw, 2012b), the OT069 revised Long-Term Monitoring Plan (Appendix I; MWH, 2011), and by evaluating historical results. The Groundwater Monitoring Decision Tree was used to evaluate the areal distribution of monitoring wells associated with each plume and identify redundant sampling locations. Table 1 includes the well identification, aquifer, screen depth, associated site(s), analysis to be performed and rationale for sampling in October 2012. Changes from the previous Fall (October 2011) sampling event are listed by site in the following sections:

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CG070. Site CG070 consists of a TCE groundwater plume present in the Upper and Lower Aquifers in the northeastern portion of the former George AFB and is part of OU1. Figures 1 and 2 identify the wells that will be sampled for VOCs, CSIA, and CENSUS parameters in October 2012 in the Upper and Lower Aquifers, respectively. Groundwater samples will be collected from 109 CG070 wells for VOC analysis, groundwater samples from twenty-six of those wells will also be used for CSIA analysis. Six of the wells selected for CSIA analysis will also be sampled for CENSUS evaluation. The CSIA analysis and CENSUS evaluation were added to the October 2012 sampling event in accordance with the Technical Memorandum for CSIA (Shaw, 2012b). Two of the wells selected for CSIA (NZ-55 and NZ-82) were not sampled in 2011. Six wells that were sampled in October 2011 will not be sampled in October 2012, as described below:

- EW-15, EW-17, and LW-1 were nondetect for TCE in the last two rounds of sampling and are redundant downgradient locations.
- LW-2 is redundant with NZ-88.
- NW-3 is redundant with LW-3.
- NZ-11 is redundant with NZ-30.

LF012. Site LF012 is an abandoned landfill covering approximately 12 acres on the eastern side of the Base and is part of OU3. Groundwater associated with LF012 is currently sampled annually and analyzed for chloride, nitrate, sulfate, and total dissolved solids. Due to variability in the analytical results of indicator parameters, the Draft OU3 Landfills LTMMP Amendment #3 recommended two rounds of groundwater sampling for additional geochemical parameters including calcium, magnesium, sodium, potassium, and alkalinity in order to assess major ion equilibrium and enable completion of a geochemical evaluation. Figure 2 identifies the four wells in the Lower Aquifer beneath LF012 that will be sampled for geochemical parameters in October 2012.

LF044. Site LF044 is an abandoned landfill covering approximately 50 acres in the northeastern portion of the Base and is part of OU3. Groundwater associated with LF044 is currently sampled annually and analyzed for chloride, nitrate, sulfate, and total dissolved solids. Figure 2 identifies the three wells in the Lower Aquifer beneath LF044 that will be sampled for geochemical parameters in October 2012.

OT069/SS030. Site OT069 is a chlorinated VOC groundwater plume present in the Upper Aquifer beneath the flightline area that is part of OU3. Site SS030 is a non-CERCLA site that contains a free product and a dissolved-phase petroleum hydrocarbon plume present in the Upper Aquifer beneath the flightline area. Site SS030 also contains a MTBE plume in the Upper Aquifer beneath SS084. Figure 3

shows the co-mingled OT069 chlorinated solvent , SS030 petroleum hydrocarbon and MTBE plumes, and identifies the sixty wells that will be sampled for VOCs in October 2012 to monitor the groundwater contaminants at these sites. Eight wells that were sampled in October 2011 will not be sampled in October 2012, as described below:

- NZ-95 is dry and has been replaced by MW-141 (MWH, 2011).

- MW-15, MW-17, MW-27 were nondetect for benzene in the last two rounds of sampling, are typically sampled annually, and were sampled in April 2012.

- MW-14, MW-56 and MW-62 are not included in the OT069 LTMP, were nondetect for all COCs in the last two rounds of sampling, and are redundant upgradient locations for the SS030 and OT069 plumes.

- MW-64 was nondetect for benzene in the last two rounds of sampling, is a redundant downgradient location for the SS030 plume, and is not included in the OT069 LTMP.

ST067b. Site ST067b is a non-CERCLA site that contains a free product and a dissolved-phase JP-4 plume present in the Upper Aquifer and is located in the southwestern portion of the Base. Monitoring wells associated with the ST067b site will not be sampled for dissolved constituents if free product is observed while gauging the depth-to-water. Figures 4 and 5 identify the twenty-one wells that will be sampled for VOCs in October 2012. Four wells with free product will not be sampled and an additional six wells that were sampled in October 2011will not be sampled for VOCs in October 2012, as described below:

- MW-10, MW-50, MW-138, MW-140 had free product present in May 2012.

- MW-143, MW-145, MW-147, MW-148, MW-149, and MW-152 were nondetect for benzene in the last two rounds of sampling and are redundant downgradient locations. These six wells will be analyzed for dieldrin as part of the OT071 plume.

OT071. Site OT071 is a dieldrin groundwater plume present in the Upper and Lower Aquifers in the southeast portion of the Base. Figures 4 and 5 identify the twenty-five wells in the Upper and Lower Aquifers that will be sampled for dieldrin in October 2012. Dieldrin analysis was removed from one well in October 2012, as described below:

- MW-132 was nondetect for dieldrin in the last two rounds of sampling and is a redundant upgradient location for the OT071 plume. This well will be analyzed for VOCs as part of the ST067b plume.

Four monitoring wells associated with Site ZZ051 and located within OU3 that were sampled in October 2011will not be sampled in October 2012. Monitoring wells MW-1-OU3, WZ-04, WZ-05, and WZ-06 will be sampled in January/February 2013 as part of the ZZ051 site investigation field work.

In summary, a total of 206 wells will be sampled during the upcoming October 2012 basewide groundwater monitoring event, and sample analysis will include 190 VOC samples, 26 CSIA samples, 25 dieldrin samples, and 7 geochemical parameter samples. All of the wells will be gauged for depth-to-water or depth-to-product. Gauging and groundwater monitoring will be performed in accordance with the Draft UFP-QAPP (Shaw, 2012a). Sampling results from the October 2012 groundwater monitoring event will be reported in the 2012 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites.

Tables

Table 1 – Monitoring Well Summary, October 2012 Basewide Groundwater Monitoring Event

Figures

Figure 1 – CG070 Upper Aquifer TCE Plume, October 2011

Figure 2 – CG070 Lower Aquifer TCE Plume, October 2011

Figure 3 – SS030 Upper Aquifer Free Product and Benzene Plume/OT069 Chlorinated VOC Plumes, October 2011

Figure 4 – ST067b Upper Aquifer Free Product and Benzene Plume/OT071 Dieldrin Plume, October 2011

Figure 5 – OT071 Lower Aquifer Dieldrin Plume, October 2011

References

MWH, 2011, ***Final 2010 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites, George Air Force Base, California,*** August.

MWH, 2012, ***Final 2011 Basewide Annual Monitoring and Operations Report for CERCLA and Non-CERCLA Sites, George Air Force Base, California,*** August.

Shaw, 2012a, ***Draft Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) Quality Program Plan – Volume 1, Former George Air Force Base, Victorville, California,*** August.

Shaw, 2012b, ***Technical Memorandum for Compound Specific Isotope Analysis, Former George Air Force Base, Victorville, California,*** September.